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REPORT ON A NEW RICINULEID FROM TEXAS

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The curious, enigmatic arachnids of the Order Ricinulei are regarded as the rarest of all arthropods. Of such infrequent occurrence are these creatures that during the past one hundred years, since the description of the first one by Guérin-Méneville in 1838, only thirty-five examples have been collected and recorded in literature. The scanty material, however, has been rich in species, for at the present time fifteen are known from the world. They are placed in two genera, *Ricinoides* (= *Cryptostemma*) of tropical Africa and *Cryptocellus* of Central and South America.

The first American representative of the Order, a female subsequently named *Cryptocellus foedus* by Westwood, was collected by H. W. Bates on his trip to the Amazon in 1861. Eight more species of *Cryptocellus* have been described since 1900, the majority during the past ten years, on the basis of sixteen specimens, most of them females. Up to the present time all the American species have come from tropical Central and South America, the most northern record being for *Cryptocellus pearsei* Chamberlin and Ivie from Yucatan. In the present paper the number of American species is increased to ten on the basis of specimens of both sexes from the lower Rio Grande Valley of Texas. The discovery of a ricinuleid within the boundaries of the United States is regarded as an event of paramount interest. Credit for the discovery of the first examples of this very distinct species belongs to Mrs. Dorothea Mulaik, for whom we have named the species, who took four specimens in Edinburg, Texas, on June 4, 1938. Subsequent collecting has been relatively successful and so far about fifteen have been taken, a number nearly equal to the total taken in the Americas by all previous collectors. In spite of the number taken, however, the species continues to be excessively rare and extremely local, having been found only in one plot of a few acres in extent.

Much remains to be learned of the habits, activities, and ecological preferences of the Ricinulei. No results of any significance have been obtained up to the present time in our efforts to solve the various problems relating to their biology, a project which must be left for the future. The specimens of *Cryptocellus dorotheae* so far taken seemed to prefer a sandy soil, and the greatest success in finding them was had shortly after rains which left the soil rather moist. They were found under a permanent cover such as afforded by slabs of concrete, heavy sheet iron, roofing material, etc., which had probably not been disturbed for several years.

The creatures are very sluggish, moving with considerable deliberation while they seem to feel their way along, the front legs and palpi being used as feelers for investigation of the terrain. Their movements simulate closely the average tick such as represented by males of the Ixodidae while crawling over the ground. An effort has been made to bring specimens into the laboratory for observation but difficulty was experienced in keeping the creatures alive. One female has been kept alive in a container for several weeks. Although psocids, collembola, other small insects, and namatodes were available as food, only one item has been observed to have been eaten—a small hymenopteron (Tiphiidae).

A few examples of the species are in the possession of Dr. Alexander Petrunkevitch of Yale University who is contemplating a report on their internal anatomy.

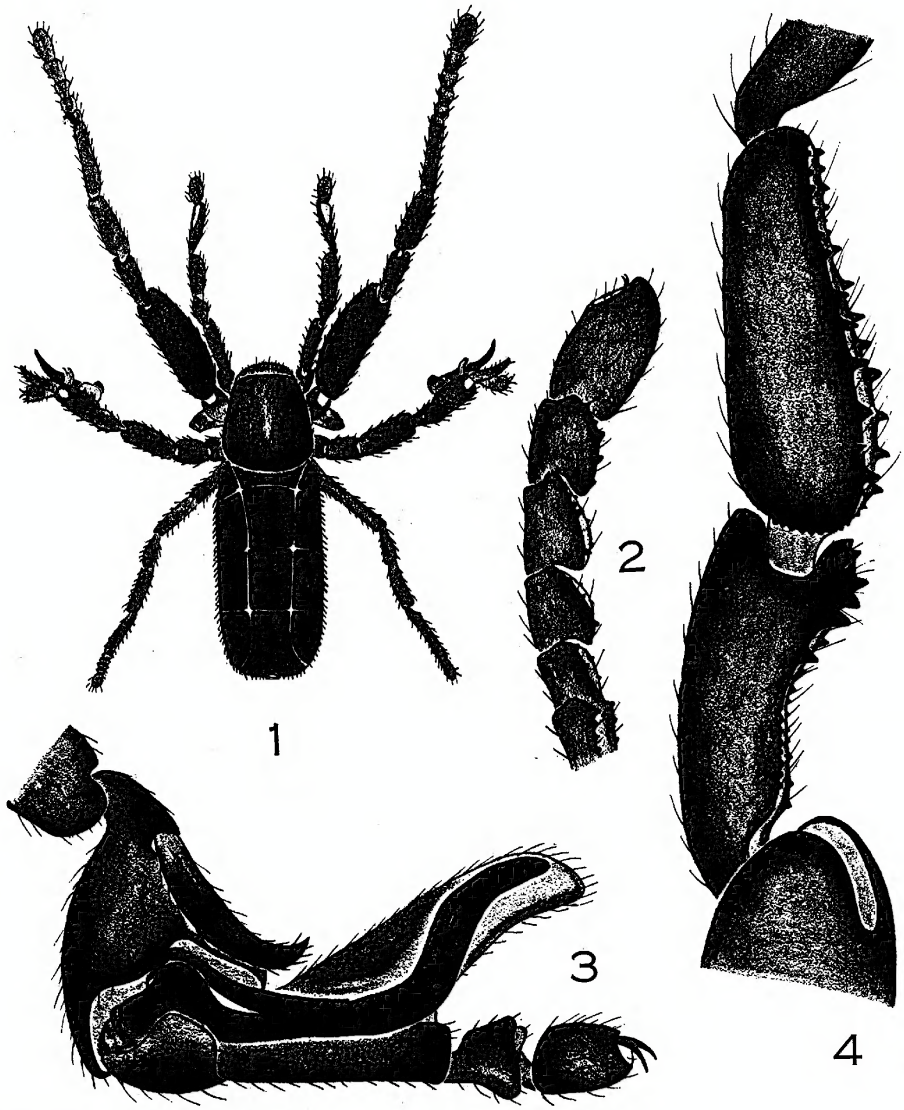

Fig. 1. *Cryptocellus dorotheae*, new species, dorsal view of male.
Fig. 2. Idem, tarsus of second left leg of male, retrolateral view.
Fig. 3. Idem, basitarsus and tarsus of third left leg of male, prolateral view, showing details of the copulatory device.
Fig. 4. Idem, patella and tibia of second right leg of male, retrolateral view.

Ricinodidae

Cryptocellus dorotheae, new species

Figures 1 to 10

Color in both sexes a bright rusty orange to red, the conjunctivae paler.

FEMALE.—Total length, 2.92 mm.

Carapace slightly broader than long (0.87 mm./0.84 mm.), subquadrangular, narrowed and truncated in front (0.47 mm.), rounded at the corners behind, the caudal margin subtruncated. Dorsal aspect as illustrated in figure 8. Carapace evenly and thickly covered with small, round, shallow pits, and sparsely set with small tubercles, most of the latter concentrated along the margins, especially in the median sulcus and on the caudal declivity. Clothing of the carapace made up of pale curved or suberect hairs which are short, subfiliform in shape, a few of them subclavate. Median groove shallow, inconspicuous, lying in the middle third, ending in a relatively broad pit, the groove and the margins supplied with small tubercles. A small pit, also set with small tubercles, is present on each side just above the

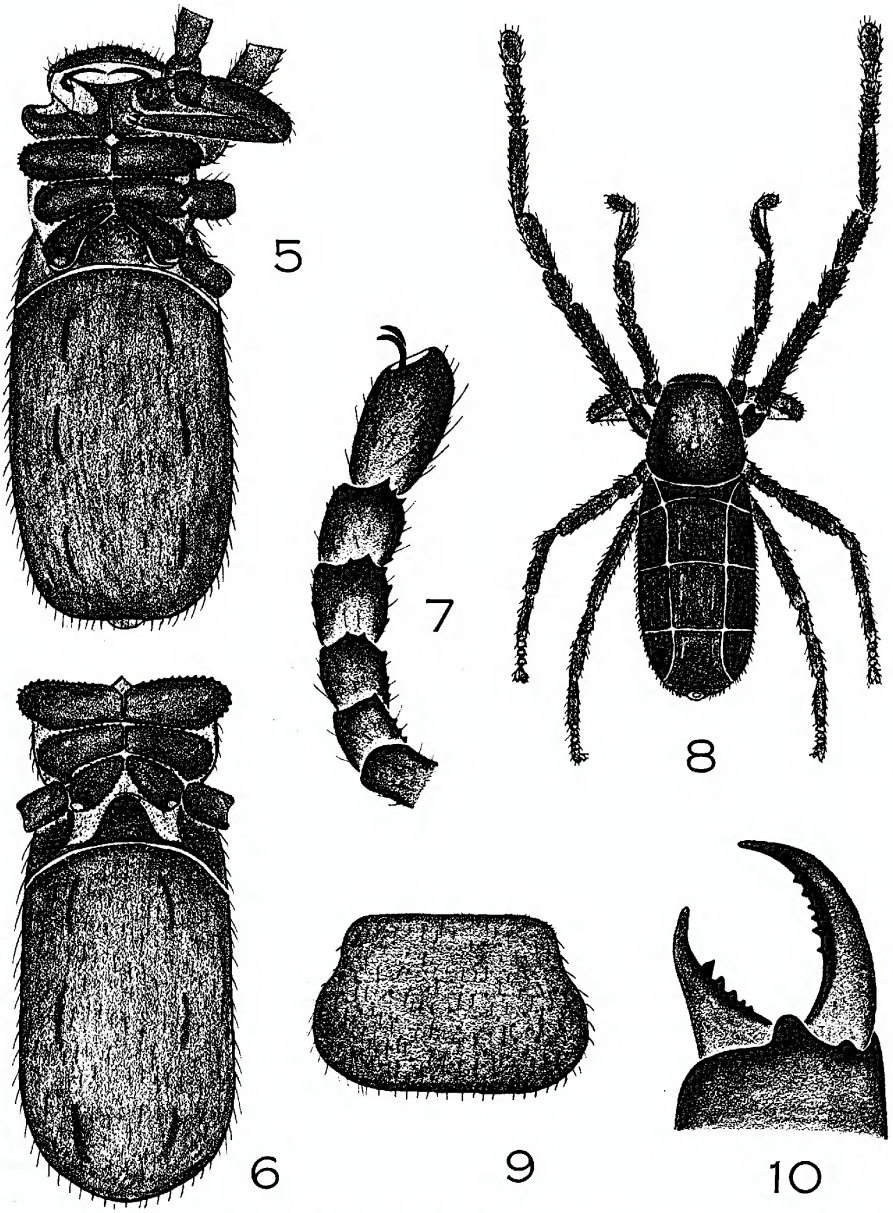

Fig. 5. *Cryptocellus dorotheae*, new species, ventral view of female, the appendages omitted.
Fig. 6. Idem, ventral view of abdomen and base of carapace of male, showing the "coupling" apparatus.
Fig. 7. Idem, tarsus of second left leg of female, retrolateral view.
Fig. 8. Idem, dorsal view of female.
Fig. 9. Idem, cucullus of female, frontal view.
Fig. 10. Idem, right chelicera of female, frontal view.

first trochanter in a position probably indicating the area once given over to the eyes when they were present in the group. Cucullus as illustrated in figure 9, two-thirds as long as broad, truncated behind at the juncture with the carapace, broadly rounded on the sides, subtruncated in front. Cucullus pitted and clothed as the carapace, with scattered tubercles, and rows of tubercles along the sides and frontal margin.

Chelicerae as shown in figure 10, hidden within the cavity covered by the cucullus. Movable

finger evenly curved, armed with six rather small teeth subequal in size. Fixed finger with the end abruptly angled, the outer margin essentially straight, armed with five teeth, the distal one largest, the others decreasing gradually in size toward the base.

Details of the venter as illustrated in figure 5. Coxae evenly pitted, and with rows of small tubercles along the margins. First coxae (0.41 mm. long) subtriangular, separated at their bases by a small sternal piece. Second coxae (0.47 mm. long) broadly contiguous at their bases, the sides essentially parallel, the distal end rounded. Third coxae (0.40 mm. long) essentially as the second but shorter. Fourth coxae (0.35 mm. long) subquadrangular in shape, slightly separated at their bases.

Palpi with a terminal chela. Legs and pedipalpi furnished with the usual light-colored pits, pale hairs, and a small number of scattered tubercles. The following measurements for the legs have been made from above. First leg: trochanter 0.20 mm., femur 0.52 mm., patella 0.30 mm., tibia 0.36 mm., basitarsus 0.50 mm., and one-jointed tarsus 0.25 mm. long; total, 2.13 mm. Second leg: trochanter 0.27 mm., femur 0.90 mm., patella 0.43 mm., tibia 0.55 mm., basitarsus 0.72 mm., and tarsus 0.80 mm. long; total, 3.67 mm. Third leg: trochanter I 0.24 mm., trochanter II 0.24 mm., femur 0.60 mm., patella 0.30 mm., tibia 0.35 mm., basitarsus 0.40 mm., and tarsus 0.38 mm. long; total, 2.51 mm. Fourth leg: trochanter I 0.24 mm., trochanter II 0.23 mm., femur 0.70 mm., patella 0.29 mm., tibia 0.39 mm., basitarsus 0.40 mm., and tarsus 0.40 mm. long; total, 2.65 mm. Leg formula, 2431. None of the joints of the relatively slender legs incrassated. Second leg longest, the femur 0.17 mm. wide at the distal end, about five times as long as the greatest width, the tubercles beneath the femur and the tibia weakly developed. Tarsus of second leg as illustrated in figure 7, five-jointed, the fifth joint much longer than the fourth. The trochanters of third and fourth legs subequal in length. Third tarsus four-jointed; fourth tarsus five-jointed, the terminal joint in each case much longer than the one preceding it.

Abdomen much longer than wide (1.90 mm./1.20 mm.), the sides subparallel, the general features as shown in figure 8. Anterior end of the abdomen emarginated to receive the caudal end of the carapace, deeply grooved transversely, the lower frontal margin as seen when uncoupled with a transverse band of small round tubercles, the upper margin of the groove with scattered larger tubercles. Dorsum of abdomen with twelve well-marked tergites in rows of three, belonging to the third, fourth, fifth, and sixth segments, respectively. Middle tergites of fourth, fifth, and sixth segments about as broad as long. All tergites evenly set with pale, shallow pits and provided with tubercles as follows: the lateral tergites with tubercles concentrated on the inner margins; the median tergites (fourth, fifth, and sixth) with numerous tubercles evenly distributed over their surfaces and with a double row outlining a shallow groove on each side. Venter of the abdomen as shown in figure 5, without distinct indications of segmentation, evenly pitted, the basal portion with numerous tubercles, the distal portion with only a few tubercles on the margins.

MALE.—Total length, 3.15 mm.

Carapace slightly longer than broad (0.93 mm./0.87 mm.), narrowed in front, 0.50 mm. Structure as illustrated in figure 1, in very close agreement with the female, the chief differences being in the legs. Clothing and sculpturing as in the female, the whole animal with small, shallow pits and small tubercles, these latter distributed and concentrated in the same places as in the other sex. Cucullus (0.57 mm. long; 0.40 mm. wide) shaped as in the female, evenly pitted, with scattered small tubercles and a group of larger ones along the anterior margin. Chelicerae toothed as in the female. Details of the venter as illustrated in figure 6, the abdomen "uncoupled" from the carapace, showing the deep grooves into which the movable fourth coxae fit.

Length of coxa I 0.40 mm.; II 0.50 mm.; III 0.40 mm.; and IV 0.33 mm. Leg measurements from above. First leg: trochanter 0.22 mm., femur 0.56 mm., patella 0.32 mm., tibia 0.37 mm., basitarsus 0.50 mm., and tarsus 0.26 mm. long; total length, 2.23 mm. Second leg: trochanter 0.32 mm., femur 0.91 mm., patella 0.55 mm., tibia 0.53 mm., basitarsus 0.73 mm., and tarsus 0.92 mm. long; total length, 3.96 mm. Third leg: trochanter I 0.25 mm., trochanter II 0.30 mm., femur 0.56 mm., tibia 0.36 mm., basitarsus 0.38 mm., and tarsus, in normal position, 0.83 mm. long; total length, 2.68 mm. Fourth leg: trochanter I 0.22 mm., trochanter II 0.24 mm., femur 0.71 mm., patella 0.31 mm., tibia 0.40 mm., basitarsus 0.45 mm., and tarsus 0.44 mm. long; total length, 2.77 mm. Leg formula, 2431.

Second leg longer and stouter than the others, the femur moderately incrassated, more so in lateral view, in this view two and one-half times as long as broad (0.40 mm./1.00 mm.), the measurement of the femur being longer in this view, 0.91 mm. as measured from above. Femur studded with stout tubercles beneath in the distal half. Details of patella and tibia of second leg in lateral view as illustrated in figure 4, the carinate side margins set with rows of stout tubercles. Second basitarsus with rows of small tubercles above and below. Second tarsus five-jointed, the distal joint longer than the others as shown in figure 2. First and fourth legs essentially as in the female, relatively slender, without particular modifications. Third leg stouter than the others, with the curious copulatory device usual in males of the group. Third femur three times as long as broad as seen from the lateral aspect. Basitarsus subtriangular in side view, distally

stout, with a heavy, free spur near the base. Details of the third tarsus as illustrated in figure 3.

Abdomen essentially as in the female, the median tergites, however, being proportionately longer, somewhat longer than broad.

TYPE LOCALITY.—Male holotype, male paratype, and female allotype from Edinburg, Texas, April 23, 1938 (Mrs. Dorothea Mulaik), in the collection of The American Museum of Natural History. Female examples from the same locality (paratypes) are in the collection of Mr. Mulaik. Several examples are also in the collection of Dr. Alexander Petrunkevitch of Yale University.

Cryptocellus dorotheae is easily distinguished from the known species of the genus by the following characters. It is smaller than any previously described species and is relatively much more slender, the median tergites of the abdomen in the female being almost as broad as long, distinctly longer than broad in the male. The chelicerae lack the large tooth at the base of the movable finger which is present in all species except *C. foedus* and *simonis* from Brazil. The integument is distinctly and evenly pitted, a character reported so far only for *C. magnus* Ewing, and the tubercles are relatively few and restricted in distribution. The third leg of the male is quite distinct from any other species, the basitarsus being very broad, and the principal spur of the copulatory mechanism narrowly rounded at the tip. The first and second legs of the male lack any strongly developed ventral spurs such as are present in *C. simonis* and *C. pearsei*, and the spines are only moderately stout.